Author Index to Volume 20

References with (L) are to Letters to the Editor.

Adcock, M. Donald (see Dunbar, Allen S.)—226 (L)
Adler, Fred P. Measurement of the complex conductivity of an ionized gas at microwave frequencies—1115
Adler, F. T., W. M. Sawyer, and John D. Ferry. Propagation of transverse waves in viscoelastic media—1036
Aigrain, Pierre R. and Everard M. Williams. Synthesis of n-reactance networks for desired transient response—597
Alessandrini, Eileen I. High temperature furnace for electron diffraction studies of thin films—691
Alexander, Leroy, Elizabeth Kummer, and Harold P. Klug. Dead time and non-linearity characteristics of the Geiger-counter x-ray spectrometer—735
Austin, A. E. (see Schwartz, C. M.)—202
Averbach, B. L. and B. E. Warren. Interpretation of x-ray patterns of cold-worked metal—885 (L)
—— The effect of cold work in metals on powder pattern intensities—1066

Backus, Robert C. (see Williams, Robley C.)—98
—— **and Robley C. Williams.** Small spherical particles of exceptionally uniform size—224 (L)
Baker, Richard F. and Daniel G. Pease. Improved sectioning technique for electron microscopy—480 (L)
Ballou, J. W. and J. C. Smith. Dynamic measurements of polymer physical properties—493
Barnes, R. Bowling (see Burton, Charles J.)—462
—— **and Charles J. Burton.** Visual methods for studying ultrasonic phenomena—286
Barrett, C. S. Book review—723
Bear, Richard S. (see Bolduan, Orvil E. A.)—983
Beatty, J. R. and J. M. Davies. Time and stress effects in the behavior of rubber at low temperature—533
Beatty, Suzanne van Dijke. Table of interplanar spacings for different target materials for the back reflection region—415 (L)
Beck, Paul A. Comments on "Grain growth in octachloropropane"—231 (L)
—— Formation of recrystallization nuclei—633 (L)
—— Some factors affecting the rate of precipitation hardening in Cu-Be alloys—666
Begovich, Nicholas A. High frequency total emission loading in diodes—457
Benfield, A. E. Effect of uplift and denudation on underground temperatures—66
Benner, Arthur H. Phase lead for a.c. servo mechanisms—268
Benzer, S. High inverse voltage germanium rectifiers—804
Beyer, R. T. (see Krumhansl, J. A.)—432, 582
Bikerman, J. J. Effect of surface roughness on rolling friction—971
Birkhoff, Garrett and Thomas E. Caywood. Fluid flow patterns—646
Birks, L. S. (see Wilkinson, P. G.)—1168
Birnbaum, George and Jacques Franeau. Measurement of the dielectric constant and loss of solids and liquids by a cavity perturbation method—817 (L)
Blachman, Nelson M. Demodulation of an F-M carrier and random noise by a limiter and discriminator—38
—— Demodulation of a frequency-modulated carrier and random noise by a discriminator—976
Bleakney, W. (see Weimer, D. K.)—418 (L)
Bolduan, Orvil E. A. and Richard S. Bear. Effective use of collimating apertures in small-angle x-ray diffraction carriers—983
Booth, A. D. Enumeration of Fourier phase permutations using electronic analog machines—388
Bott, R. and R. J. Duffin. Impedance synthesis without use of transformers—816 (L)
Boyer, Raymond F. Compatibility, efficiency and permanence of plasticizers—540
Bracewell, R. N. and K. Weekes. Ionospheric absorption—724 (L)
Breazeale, Francis and John Whisnant. Apparatus to depict the load-elongation diagram of yarn at five cycles per second—621
Brentano, J. C. M. Method for the quantitative evaluation of x-ray patterns from mixed powders adapted to the demands of quantitative analysis—1215
Brewer, G. R. (see Malter, L.)—918
Bridgman, P. W. Volume changes in the plastic stages of simple compression—1241
Brillouin, L. The scattering cross section of spheres for electromagnetic waves—1110
—— The traveling-wave tube (discussion of waves for large amplitudes)—1196
Brodsky, R. F. (see Wang, Chi-Teh)—1255
Brown, Alexander. X-ray diffraction studies of the stretching and relaxing of polyethylene—552
Brown, S. Leroy and Chester M. McKinney. Use of a mechanical harmonic synthesizer in electrical network analysis—316
Brown, S. Leroy and James M. Sharp. Use of a mechanical harmonic synthesizer in electric wave filter analysis—578
Bueche, A. M. (see Debye, P.)—518
Burton, Charles J. (see Barnes, R. Bowling)—286
—— (see Schneider, William C.)—48
—— **and R. Bowling Barnes.** Visual method for demonstrating the path of ultrasonic waves through thin plates of material—462
Burwell, J. T. and C. D. Strang. Incremental friction coefficient—a non-hydrodynamic component of boundary lubrication—79
Bush, O. B., R. B. Vandegrift, and T. E. Hanley. Use of titanium and zirconium nitrides as a conducting element in thoria cathodes—295 (L)

Cady, W. M. (see Marlow, D. G.)—771
Caywood, Thomas E. (see Birkhoff, Garrett)—646
Chandler, C. H. An investigation of dielectric rod as wave guide—1188
Cheng, P. T. (see McCrone, W. C.)—230 (L)
Christ, C. L. (see McLachlan, Dan, Jr.)—829
Chu, E. L. and W. W. Hansen. Disk-loaded wave guides—280
Clark, J. C. Flash radiography applied to ordnance problems—363
Clark, Orrin H. and Ernest M. Lyman. Note on some plastic flow effects in steel—884 (L)
Cohn, S. B. Analysis of the metal-strip delay structure for microwave lenses—257; addendum—1011
Colino, A. Notes on the excitation of electromagnetic waves in cylindrical metallic wave guides—576
Conant, F. S., G. L. Hall, and G. R. Thurman. Relationship between Gough-Joule coefficients and moduli of vulcanized rubbers—526
Conley, Patrick. Antennas and open-wire lines. Part III: Image-line measurements—1022
Cooley, J. P. (see Wantuch, E.)—112
Copeland, Paul L. and Delbert N. Eggenberger. Electron transit time in space-charge limited current between coaxial cylinders—1148

Courant, E. D. Resonance effect in the synchrotron—611
Crede, J. H. and J. P. Martin. Magnetic characteristics of an oriented 50 percent nickel-iron alloy—966
Creutz, E. (see Falk, C. E.)—1183
—— **and K. Downes.** Magnetite concrete for radiation shielding—1236
Cyr, R. R. (see Schaaf, S. A.)—860

Danforth, W. E. and D. L. Goldwater. Resistance of oxide cathode coatings for high values of pulsed emission—163
Davies, John M. Aerodynamics of golf balls—821
—— (see Beatty, J. R.)—533
Debye, P. and A. M. Bueche. Scattering by an inhomogeneous solid—518
Dedrick, J. H. and A. Gerds. A study of the mechanism of sintering of metallic particles—1042
Dodge, C. H. (see Tangren, R. F.)—637
Dorn, John E. Stress-strain rate relations for anisotropic plastic flow—15
Downes, K. (see Creutz, E.)—1236
Drucker, D. C. An analysis of the mechanics of metal cutting—1013
Druesne, M. A. A. (see Prichard, A. C.)—1011 (L)
Duffin, R. J. (see Bott, R.)—816 (L)
Dunbar, Allen S. and M. Donald Adcock. Measurement of gain of electromagnetic horns—266 (L)

Eggenberger, Delbert N. (see Copeland, Paul L.)—1148
Eisenstein, A. Some properties of the Ba_2SiO_4 oxide cathode interface—776
El-Fandy, M. G. Dust—an active meteorological factor in the atmosphere of Northern Africa—660
Ellis, S. G. (see Hillier, James)—700
Elsasser, Walter M. Attenuation in a dielectric circular rod —1193
English, William N. (see Moore, Donald Baker)—370
—— **and Leonard B. Loeb.** Point-to-plane corona onsets—707
Enright, D. P., L. R. Sonders, and W. A. Weyl. Surface polarization and wettability of inorganic substances by water—1011 (L)
Estermann, I. and E. D. Kane. Torsion balance for measuring forces in low density gas flows—608

Falk, C. E. and E. Creutz. The attenuation of neutrons of various energies in water—1183
Fan, H. Y. Thermionic emission from sintered cathode of thoria and tungsten mixture—682
Fankuchen, I. (See Miller, E.)—531
Feaster, G. R. Pulse emission decay phenomenon in oxide-coated cathodes—415 (L)
Ferry, John D. (see Adler, F. T.)—1036
—— (see Smith, Thor L.)—144
Field, Michael and M. Eugene Merchant. Reflection method of determining preferred orientation on the Geiger-counter spectrometer—741
Finklenburg, Wolfgang. High current carbon arc and its mechanism—468
Fletcher, C. H. (see Weimer, D. K.)—418 (L)
Found, C. G. (see Oleson, N. L.)—416 (L)
Franeau, Jacques (see Birnbaum, George)—817 (L)
Fusfeld, Herbert I. New interpretation of the *n*-power law in plastic deformation—1052
Fuson, Nelson. Effect of current magnitude upon the behavior of a superconducting bolometer in its transition region—59

Gaudry, F. (see Petrauskas, A. A.)—1257 (L)
Geisler, A. H. (see Newkirk, J. B.)—816 (L)
Gemant, Andrew. Ionization of paraffin wax by beta-radiation—887
Gerds, A. (see Dedrick, J. H.)—1042
Germer, L. H. and F. E. Haworth. Erosion of electrical contacts on make—1085
Gilmore, G. D. (see Spencer, R. S.)—502
Goldman, J. E. The influence of atomic order on the magnetic properties—1131
Goldwater, D. L. (see Danforth, W. E.)—163
—— (see Haddad, R. E.—886 (L), 1130 (L)
Goodman, Lawrence E. (see Mindlin, Raymond D.)—89
Gordon, Paul. High temperature precision x-ray camera. Some measurements of the thermal coefficients of expansion of beryllium—908
Gordon, W. E. (see Hamlin, E. W.)—248
Greig, J. H. (see Wantuch, E.)—112
Grube, W. L. Effect of "multiple grounds" on electron microscope images—125 (L)
Guth, E. (see Ivey, Donald G.)—486
—— (see Witte, R. S.)—481

Haddad, R. E., D. L. Goldwater, and F. H. Morgan. Zirconium carbide as a thermionic emitter—886 (L)
—— Thermionic emitting properties of two refractories —1130 (L)
Hainer, R. M. (see King, Gilbert W.)—559
Hall, Cecil E. Method of measuring spherical aberration of an electron microscope objective—631 (L)
Hall, G. L. (see Conant, F. S.)—526
Hall, R. N. The application of non-integral Legendre functions to potential problems—925
Hamlin, E. W., P. A. Seay, and W. E. Gordon. New solution to the problem of vertical angle-of-arrival of radio waves—248
Hanley, T. E. (see Bush, O. B.)—295 (L)
Hannay, N. B., D. MacNair, and Addison H. White. Semi-conducting properties in oxide cathodes—669
Hansen, W. W. (see Chu, E. L.)—280
Harman, W. W. Impedance of resonant transmission lines and wave guides—1252
Harrison, Shirley. Aberration phenomenon in electrostatic lenses—412 (L)
Hartley, R. V. L. Note on "The mixing properties of non-linear condensers"—819 (L)
Haworth, F. E. (see Germer, L. H.)—1085
Hay, D. R. (see Woonton, G. A.)—71
Hebb, M. H., C. W. Horton, and F. B. Jones. On the design of networks for constant time delay—616
Heidenreich, R. D. Electron microscope and diffraction study of metal crystal textures by means of thin sections —993
Heinmets, F. Modification of silica replica technique for study of biological membranes and application of rotary condensation in electron microscopy—384
Hillier, James and S. G. Ellis. Illuminating system of the electron microscope—700
Hillier, K. W., H. Kolsky, and J. P. Lewis. Method of measuring dynamic mechanical properties of rubber-like materials—227 (L)
Holm, Else, Ragnar Holm, and Erle I. Shobert II. Theory of hardness and measurements applicable to contact problems—319
Holm, Ragnar. Vaporization of the cathode in the electric arc—715
—— (see Holm, Else)—319
Horton, C. W. (see Hebb, M. H.)—616
—— (see Morrison, H. L.)—1027
Hsiao, C. C. (see Sauer, J. A.)—507
Hudson, Douglas Rennie. Density and packing in an aggregate of mixed spheres—154
Hull, Gordon Ferrie, Jr. Book review—126
Hull, Harry H. A method for studying the distribution and sign of static charges on solid materials—1157

Ivey, Donald G., B. A. Mrowca, and E. Guth. Propagation of ultrasonic bulk waves in high polymers—486
Izard, Emmette F. (see Kolb, Harry J.)—564, 571

Jaffe, L. D. Phase distribution in two-phase solids—1206
Johnson, James R. Photo-density method of determining the relative penetration of diffused sodium 24 tracer into glass—129; erratum—819 (L)
Jones, F. B. (see Hebb, M. H.)—616

Kane, E. D. (see Estermann, I.)—608
Kaye, Wilbur. An electron microscope technique for the study of polymeric molecules—1209
Kê, T'ing-Sui. Grain boundary model and the mechanism of viscous intercrystalline slip—274
—— Grain boundary relaxation and the mechanism of embrittlement of copper by bismuth—1226
Keller, Herbert B. and Joseph B. Keller. Reflection and transmission of electromagnetic waves by a spherical shell —393
Keller, Joseph B. (see Keller, Herbert B.)—393
Kelso, John M. Note on the maximum height of reflection of a radio wave in a curved ionosphere layer—632 (L)
King, Gilbert W., R. M. Hainer, and H. O. McMahon. Infra-red absorption spectra of some polymers at liquid-helium temperatures—559
King, Ronold. Antennas and open-wire lines. Part I. Theory and summary of measurements—832
Klug, Harold P. (see Alexander, Leroy)—735
Knipp, Julian K. On the velocity-dependent characteristics of high frequency tubes—425
Kolb, Harry J. and Emmette F. Izard. Dilatometric studies of high polymers. I. Second-order transition temperature—564; II. Crystallization of aromatic polyesters—571
Kolsky, H. (see Hillier, K. W.)—227 (L)
Krumhansl, J. A. and R. T. Beyer. Barkhausen noise and magnetic amplifiers. I. Theory of magnetic amplifiers—432; II. Analysis of the noise—582
Kuczynski, G. C. Study of the sintering of glass—1160
Kuhlthau, A. R. Air friction on rapidly moving surfaces—217
Kummer, Elizabeth (see Alexander, Leroy)—735

Lachenbruch, S. H. (see Marton, L.)—1171, 1258 (L)
Lehovec, K. New method of capacity measurement on dry disk rectifiers—123 (L)
Levenson, Morris E. Harmonic and subharmonic response for the Duffing equation—1045
Levinstein, Henry. Growth and structure of thin metallic films—306
Lewis, C. R. (see Strang, C. D.)—1164
Lewis, J. P. (see Hillier, K. W.)—227 (L)
Ling, D. P. (see Germer, L. H.) Appendix A. Effect of steady value current upon erosion—1108
Loeb, Leonard B. (see English, William N.)—707
Loosjes, R. and H. J. Vink. Electron emission and conduction mechanism of oxide-coated cathodes—884 (L)
Ludeke, Carl A. Electro-mechanical device for solving non-linear differential equations—600
—— Method of equivalent linearization for non-linear oscillatory systems with large non-linearity—694
Lund, Louis H. and George H. Vineyard. Inter-particle interference effects in the small-angle x-ray scattering from fine powders—593
Lyman, Ernest M. (see Clark, Orrin H.)—884 (L)

Mack, Charles. Coefficient of anomalous viscosity—225 (L)
MacNair, D. (see Hannay, N B.)—669
Mahlman, G. W. Work functions and conductivity of oxide-coated cathodes—197
Malter, L. and G. R. Brewer. Microwave Q measurements in the presence of series losses—918
Manning, L. A., O. G. Villard, Jr., and A. M. Peterson. Radio Doppler investigation of meteoric heights and velocities—475
Marboe, Evelyn C. and W. A. Weyl. Method for studying the forces between metals and ionic substances—124 (L)
Marin, J. (see Sauer, J. A.)—507
Mark, H. (see Miller, E.)—531
Marlow, D. G., C. R. Nisewanger, and W. M. Cady. Method for the instantaneous measurement of velocity and temperature in high speed air flow—771
Martin, D. L. (see Newkirk, J. B.)—816 (L)
Martin, J. P. (see Crede, J. H.)—966
Marton, L. and S. H. Lachenbruch. Electron optical mapping of electromagnetic fields—1171
——, S. H. Lachenbruch, John A. Simpson, and A. Van-Bronkhorst—1258 (L)
Masket, A. Victor. Measurement of forces resisting armor penetration—132
Mason, S. J. Comment on Dr. Vazsonyi's paper "A generalization of Nyquist's stability criteria"—867
Mason, W. P. and H. J. McSkimin. Errata: Energy losses of sound waves in metals due to scattering and diffusion—228 (L)
May, K. R. An improved spinning top homogeneous spray apparatus—932
McCaa, D. G. (see Prichard, A. C.)—1011 (L)
McCracken, Leslie G. Note on the ionospheric absorption problem—229 (L)
McCrone, W. C. and P. T. Cheng. Grain growth in octachloropropane—230 (L)
McCutcheon, Don M. Cathodic vacuum etching of metals—414 (L)
McKinney, Chester M. (see Brown, S. Leroy)—316
McLachlan, Dan, Jr. Determination of relative phases of Fourier coefficients from x-ray diffraction data—295 (L); erratum—1011
—— **and C. L. Christ.** Projection of crystal structure factors on the reciprocal lattice—829
McMahon, H. O. (see King, Gilbert W.)—559
McReynolds, Andrew W. Effects of stress and deformation on the Martensite transformation—896 (L)
McSkimin, H. J. (see Mason, W. P.)—228 (L)
Merchant, M. Eugene (see Field, Michael)—741
Metson, G. H. Papers by Hadrian Stahl—1130 (L)
Michels, Walter C. and Sally Wilford. The physical properties of titanium. I. Emissivity and resistivity of the commercial metal—1223
Middleton, David. On theoretical signal-to-noise ratios in F-M receivers: a comparison with amplitude modulation—334; errata—724
Miles, J. W. On the diffraction of an electromagnetic wave through a plane screen—760
Miller, E., I. Fankuchen, and H. Mark. Polymerization in the solid state—531
Miller, Theodore. Magnetically controlled wave guide attenuators—878
Millman, George H. and Richard C. Raymond. Absorption of microwaves in gases—413 (L)
Mindlin, Raymond D. Mathematical theory of photo-viscoelasticity—206
—— **and Lawrence E. Goodman.** Optical equations of three-dimensional photoelasticity—89
Moore, A. D. Fields from fluid flow mappers—790
Moore, Donald Baker and William N. English. Point-to-plane impulse corona—370
Morduchow, Morris. On surface-fitting in three variables —390
Morgan, F. H. (see Haddad, R. E.)—886 (L), 1130 (L)
Morgan, Samuel P., Jr. Effect of surface roughness on eddy current losses at microwave frequencies—352

Morrison, H. L., F. T. Rogers, Jr., and C. W. Horton. Convection currents in porous media—1027
Mottlau, A. Y. A technique for the preparation of grease or solid samples dispersed in grease-like media for examination with the electron microscope—1055
Mrowca, B. A. (see Ivey, Donald G.)—486
—— (see Witte, R. S.)—481
Muckenhoupt, Carl F. Distribution of temperature and current in cylindrical bodies—939
Munk, M. M. On supersonic flow patterns—302
Muraour, Henri. Note on "Qualitative experimental verification of the change of burning rate of rocket powders with radiation path length"—819 (L)

Newkirk, J. B., A. H. Geisler, and D. L. Martin. Ordering reaction in Co-Pt alloys—816 (L)
Nisewanger, C. R. (see Marlow, D. G.)—771
Nolle, A. W. Comment on "A method of measuring dynamic mechanical properties of rubber-like materials"—277 (L)
—— Electric-field modulation of ultrasonic signals in liquids—589

Okress, E. C. Potential functions for a thermionic vacuum tube—850
Okubo, H. Bending of a thin circular plate of an aeolotropic material under uniform lateral load (supported edge)—1151
—— On the torsion of a prismatic cylinder with a star-shaped section—1155
Oleson, N. L. and C. G. Found. Running striations and multiple electron temperatures—416 (L)

Pal, A. B. Stabilization of breakdown voltage and measurement of some critical currents in a glow tube—451
Papas, Charles H. On the infinitely long cylindrical antenna—437
Pease, Daniel G. (see Baker, Richard F.)—480 (L)
Pell, E. M. (see Tomboulian, D. H.)—263
Penner, S. S. Flow through a rocket nozzle with and without vibrational equilibrium—445
—— Reply to Muraour's letter to the editor—819 (L)
Pepper, Paul M. Coexistence relations of $n+1$ phases in n-component systems—754
Peterson, A. M. (see Manning, L. A.)—475
Petrauskas, A. A. and F. Gaudry. Orientation of single-crystal rods of copper grown from the melt—1257 (L)
Petzold, R. F. (see Singer, S. J.)—816 (L)
Pierce, J. R. Increasing space charge waves—1060
Popov, E. P. Bending of beams with creep—251
Prager, William. Recent developments in the mathematical theory of plasticity—235
Prichard, A. C., M. A. A. Druesne, and D. G. McCaa. Increase in Q-value and reduction of aging of quartz crystal blanks—1011 (L)
Prim, R. C. III. Note on the substitution principle for steady gas flow—448
Protzman, Thomas F. Transition temperatures of methyl methacrylate polymers at ultrasonic frequencies—627

Ragazzini, John R. and Lotfi A. Zadeh. Probability criterion for the design of servo mechanisms—141
Ramberg, E. G. Aberration correction with electron mirrors—183
—— Phase contrast in electron microscope images—441
Raymond, Richard C. (see Millman, George H.)—413 (L)
—— (see Webb, Wayne)—330
—— **and Wayne Webb.** Radiation resistances of loaded antennas—328
Redheffer, R. M. Microwave antennas and dielectric surfaces—397
Rogers, F. T., Jr. (see Morrison, H. L.)—1027
Rohrbaugh, J. H. (see Wantuch, E.)—112
Rosen, Philip. Propagation of electromagnetic waves in a tube containing a coaxial d.c. discharge—868
Rosenthal, D. X-ray diffraction line broadening and strain hardening—1257 (L)

Sauer, J. A., J. Marin, and C. C. Hsiao. Creep and damping properties of polystyrene—507
Saunders, R. A. and D. C. Smith. Infra-red spectra and structure of hevea and gutta elastomers—953
Sawyer, W. M. (see Adler, F. T.)—1036
Schaaf, S. A. and R. R. Cyr. Time constants for vacuum gauge systems—860
Scherzer, O. Theoretical resolution limit of the electron microscope—20
Schlitt, Helmut. Investigations of a bearing for small angular deflections without any friction and with negligible restoring torque—297
Schneider, William C. and Charles J. Burton. Determination of the elastic constants of solids by ultrasonic methods—48
Schnurmann, Robert. Thermoelectric experiments with extreme-pressure lubricants—376
Schremp, Frederic W. (see Smith, Thor L.)—144
Schulz, L. G. A direct method of determining preferred orientation of a flat reflection sample using a Geiger counter x-ray spectrometer—1030
—— Determination of preferred orientation in flat transmission samples using a Geiger counter x-ray spectrometer—1033
Schumacher, William C. "Preliminary study of a physical basis of bird navigation"—123 (L)
Schwartz, C. M., A. E. Austin, and P. M. Weber. Positive-replica technique for electron microscopy—202
Schwertz, F. A. The structure of porous materials from gas penetration rates—1070
Scott, G. David. Spherical particles for electron microscopy—417 (L)
Seay, P. A. (see Hamlin, E. W.)—248
Seemann, Herman E. Comments on "Electronic radiography and microradiography"—231 (L)
Seifert, H. S. (see Tangren, R. F.)—637
Sharp, James M. (see Brown, S. Leroy)—578
Shmoys, J. (see Wantuch, E.)—112
Shobert, Erle I., II (see Holm, Else)—319
Simpson, John A. (see Marton, L.)—1258 (L)
Singer, S. J. and R. F. Petzold. Improvement in the shadow-cast replica technique—816 (L)
Smith, Cyril Stanley. On blowing bubbles for Bragg's dynamic crystal model—631 (L)
Smith, D. C. (see Saunders, R. A.)—953
Smith, Donald P. The role of rifting in cold-work and a possible measure of plastic deformation—1186
Smith, J. C. (see Ballou, J. W.)—493
Smith, P. D. P. Tensor field equations in a region of variable refractive index—633 (L)
—— Comments on biconical antennas—633 (L)
—— Ground plane field of the wide-angle conical dipole—636 (L)
Smith, Thor L., John D. Ferry, and Frederic W. Schremp. Measurements of the mechanical properties of polymer solutions by electromagnetic transducers—144
Smoluchowski, R. and R. W. Turner. Influence of magnetic field on recrystallization—745
Smythe, W. R. On the flow of a perfect fluid between two plates from a circular inlet channel—224 (L)
Sonders, L. R. (see Enright, D. P.)—1011 (L)
Spencer, R. S. and G. D. Gilmore. Equation of state for polystyrene—502
Spencer, Roy C. Discussion of "Geometrical factors affecting x-ray spectrometer maxima"—413 (L)

Stahl, H. A. Structure of extremely thin layers evaporated in kinetic vacuum systems—1
—— Thermal behavior of evaporated layer vacuum devices —8; erratum—724
Steinitz, Robert. Magnetic properties of iron compacts in relation to sintering temperature—712
Straiton, A. W. Extension of MacFarlane's method of deducing refractive index from radio observations—228 (L)
Strang, C. D. (see Burwell, J. T.)—79
—— **and C. R. Lewis.** On the magnitude of the mechanical component of solid friction—1164
Straumanis, M. E. Precision determination of lattice constants by the powder and rotating crystal methods and applications—726
Sulzer, Peter G. Sweep frequency ionosphere equipment—187
Symonds, P. S. Determination of stresses in plastic regions in problems of plane flow—107

Tai, C. T. Study of the e.m.f. method—717
—— Application of a variational principle to biconical antennas—1076
Tangren, R. F., C. H. Dodge, and H. S. Seifert. Compressibility effects in two-phase flow—637
Tasny-Tschiassny, L. Triangulation of a two-dimensional continuum for the purpose of the approximate solution of second-order partial differential equations—419
Thurman, G. R. (see Conant, F. S.)—526
Tomboulian, D. H. and E. M. Pell. Response of certain inorganic phosphors to far ultraviolet radiation—263
Tomiyasu, K. Antennas and open-wire lines. Part II: Measurements on two-wire lines—892
Turnbull, D. Subcooling of liquid metals—817 (L)
Turner, R. W. (see Smoluchowski, R.)—745
Tyndall, E. P. T. (see Wert, C. A.)—587

VanBronkhorst, A. (see Marton, L.)—1258 (L)
Vandegrift, R. B. (see Bush, O. B.)—295 (L)
Vazsonyi, A. Generalization of Nyquist's stability criteria —863
Victoreen, John A. The calculation of x-ray mass absorption coefficients—1141
Villard, O. G., Jr. (see Manning, L. A.)—475
Vineyard, George H. (see Lund, Louis H.)—593
Vink, H. J. (see Loosjes, R.)—884 (L)
Vogan, E. L. (see Woonton, G. A.)—71

Walkinshaw, W. Notes on "Wave guides for slow waves" —634 (L)
Wang, Chi-Teh and R. F. Brodsky. Application of Galerkin's method to compressible fluid flow problems—1255
Wantuch, E., J. H. Rohrbaugh, J. P. Cooley, J. H. Greig, and J. Shmoys. Erratum: Transmission properties of materials in the millimeter wave region—112
Warren, B. E. Method for measuring the total power of small-angle x-ray scattering—96
—— (see Averbach, B. L.)—885 (L), 1066
Watson, John H. L. Morphology of carbon black particles in shadow-cast specimens—747
Wax, Nelson. Some properties of tubular electron beams—242
Webb, Wayne (see Raymond, Richard C.)—328
—— **and Richard C. Raymond.** Current distributions on some simple antennas—330
Weber, P. M. (see Schwartz, C. M.)—202
Weekes, K. (see Bracewell, R. N.)—724 (L)
Weimer, D. K., C. H. Fletcher, and W. Bleakney. Transonic flow in a shock tube—418 (L)
Weinbaum, Sidney and H. L. Wheeler, Jr. Heat transfer in sweat-cooled porous metals—113
Weinreich, O. A. Activation phenomena with thoria cathodes —1256 (L)
Wert, Charles A. Internal friction of zinc single crystals—29
—— Precipitation from solid solution of C and N in α-iron —943
—— **and E. P. T. Tyndall.** Elasticity of zinc crystals—587
Weyl, W. A. (see Enright, D. P.)—1011 (L)
—— (see Marboe, Evelyn C.)—124 (L)
Wheeler, H. L., Jr. (see Weinbaum, Sidney)—113
Whisnant, John (see Breazeale, Francis)—621
White, Addison H. Application of thermodynamics to chemical problems involving the oxide cathode—856
—— (see Hannay, N. B.)—669
Wilford, Sally (see Michels, Walter C.)—1223
Wilkinson, P. G. and L. S. Birks. Properties of gold deposited at liquid air temperature—1168
Williams, Everard M. (see Aigrain, Pierre R.)—597
Williams, Robley C. (see Backus, Robert C.)—224 (L)
—— **and Robert C. Backus.** Electron-micrographic structure of shadow-cast films and surfaces—98
Winslow, W. M. Electrically induced fibration of suspensions—1137
Witte, R. S., B. A. Mrowca, and E. Guth. Propagation of audiofrequency sound in high polymers—481
Woonton, G. A., D. R. Hay, and E. L. Vogan. Experimental investigation of formulas for the prediction of horn radiator patterns—71

Yudowitch, K. L. Particle size determination by soft x-ray scattering—174
—— Collimation error in small angle x-ray scattering—1232

Zadeh, Lotfi A. (see Ragazzini, John R.)—141
Zener, Clarence. Theory of growth of spherical precipitates from solid solution—950

Subject Index to Volume 20

References with (L) are to Letters to the Editor.

Aberration correction with electron mirrors, E. G. Ramberg —183

Aberration phenomenon in electrostatic lenses, Shirley Harrison—412 (L)

Absorption of microwaves in gases, George H. Millman and Richard C. Raymond—413 (L)

Activation phenomena with thoria cathodes, O. A. Weinreich —1256 (L)

Aerodynamics of golf balls, John M. Davies—821

Africa, Northern, Dust—an active meteorological factor in the atmosphere of, M. G. El-Fandy—660

Air flow, high speed, Method for the instantaneous measurement of velocity and temperature in, D. G. Marlow, C. R. Nisewanger, and W. M. Cady—771

Air friction on rapidly moving surfaces—A. R. Kuhlthau—217

Amplitude modulation, Theoretical signal-to-noise ratios in F-M receivers: a comparison with amplitude modulation, David Middleton—334; errata—724 (L)

Analysis of the mechanics of metal cutting, D. C. Drucker—1013

Analysis of the metal-strip delay structure for microwave lenses, S. B. Cohn—257; addendum—1011 (L)

Angle-of-arrival, vertical, of radio waves, New solution to the problem of, E. W. Hamlin, P. A. Seay, and W. E. Gordon—248

Anisotropic plastic flow, Stress-strain rate relations for, John E. Dorn—15

Antenna, Infinitely long cylindrical, Charles H. Papas—437

Antennas, Biconical, P. D. P. Smith—633 (L)

Antennas, biconical, Application of a variational principle to, C. T. Tai—1076

Antennas, loaded, Radiation resistances of, Richard C. Raymond and Wayne Webb—328

Antennas, Microwave, and dielectric surfaces, R. M. Redheffer—397

Antennas and open-wire lines. Part I. Theory and summary of measurements, Ronold King—832

—— Part II. Measurements on two-wire lines, K. Tomiyasu —892

—— Part III. Image-line measurements, Patrick Conley—1022

Antennas, simple, Current distributions on, Wayne Webb and Richard C. Raymond—330

Apparatus to depict the load-elongation diagram of yarn at five cycles per second, Francis Breazeale and John Whisnant—621

Application of Galerkin's method to compressible fluid flow problems, Chi-Teh Wang and R. F. Brodsky—1255

Application of non-integral Legendre functions to potential problems, R. N. Hall—925

Application of thermodynamics to chemical problems involving the oxide cathode, Addison H. White—856

Application of a variational principle to biconical antennas, C. T. Tai—1076

Armor penetration, Measurement of forces resisting, A. Victor Masket—132

Atomic order, Influence of, on the magnetic properties, J. E. Goldman—1131

Attenuation in a dielectric circular rod, Walter M. Elsasser —1193

Attenuation of neutrons of various energies in water, C. E. Falk and E. Creutz—1183

Audiofrequency sound in high polymers, Propagation of, R. S. Witte, B. A. Mrowca, and E. Guth—481

Barkhausen noise and magnetic amplifiers. I. Theory of magnetic amplifiers, J. A. Krumhansl and R. T. Beyer—432

—— II. Analysis of the noise, J. A. Krumhansl and R. T. Beyer—582

Ba_2SiO_2 oxide cathode interface, Some properties of, A. Eisenstein—776

Beams, Bending of, with creep, E. P. Popov—251

Bearing, Investigations of a, for small angular deflections without any friction and with negligible restoring torque, Helmut Schlitt—297

Bending of beams with creep, E. P. Popov—251

Bending of a thin circular plate of an aeolotropic material under uniform lateral load (supported edge), H. Ōkubo —1151

Beryllium, High temperature precision x-ray camera. Some measurements of the thermal coefficients of expansion of, Paul Gordon—908

Beta-radiation, Ionization of paraffin wax by, Andrew Gemant —887

Biconical antennas, P. D. P. Smith—633 (L)

Biological membranes, Modification of silica replica technique for study of, and application of rotary condensation in electron microscopy, F. Heinmets—384

Bird navigation, Preliminary study of a physical basis of, William C. Schumacher—123 (L)

Blowing bubbles for Bragg's dynamic crystal model, Cyril Stanley Smith—631 (L)

Bolometer, Effect of current magnitude upon the behavior of a superconducting bolometer in its transition region, Nelson Fuson—59

Boundary lubrication, Incremental friction coefficient—a nonhydrodynamic component of, J. T. Burwell and C. D. Strang—79

Boundary model, Grain, and the mechanism of viscous intercrystalline slip, T'ing-Sui Kê—274

Bragg's dynamic crystal model, Blowing bubbles for, Cyril Stanley Smith—631 (L)

Bubbles, Blowing bubbles for Bragg's dynamic crystal model, Cyril Stanley Smith—631 (L)

Calculation of x-ray mass absorption coefficients, John A. Victoreen—1141

Carbon arc, High current, and its mechanism, Wolfgang Finkelnburg—468

Carbon black particles, Morphology of, in shadow-cast specimens, John H. L. Watson—747

Cathode, sintered, of thoria and tungsten mixture, Thermionic emission from, H. Y. Fan—682

Cathode, Vaporization of, in the electric arc, Ragnar Holm —715

Cathode, oxide-coated, Pulse emission decay phenomenon in, G. R. Feaster—415 (L)

Cathodes, oxide-coated, Work functions and conductivity of, G. W. Mahlman—197

Cathodes, thoria, Activation phenomena with, O. A. Weinreich—1256 (L)

Cathodes, thoria, Use of titanium and zirconium nitrides as a conducting element in, O. B. Bush, R. B. Vandegrift, and T. E. Hanley—295 (L)

Cathodic vacuum etching of metals, Don M. McCutcheon—414 (L)

Coefficient of anomalous viscosity, Charles Mack—225 (L)

Coexistence relations of $n+1$ phases in n-component systems, Paul M. Pepper—754

Cold work, Role of rifting in, and a possible measure of plastic deformation, Donald P. Smith—1186

Collimating apertures, Effective use of, in small-angle x-ray diffraction carriers, Orvil E. A. Bolduan and Richard S. Bear—983
Collimation error in small angle x-ray scattering, K. L. Yudowitch—1232
Comment on "A method of measuring dynamic mechanical properties of rubber-like materials," A. W. Nolle—227 (L)
Comments on "Electronic radiography and microradiography," Herman E. Seemann—231 (L)
Comments on "Grain growth in octachloropropane," Paul A. Beck—231 (L)
Compatibility, efficiency and permanence of plasticizers, Raymond F. Boyer—540
Compressibility effects in two-phase flow, R. F. Tangren, C. H. Dodge, and H. S. Seifert—637
Compression, simple, Volume changes in the plastic stages of, P. W. Bridgman—1241
Concrete, Magnetite, for radiation shielding, E. Creutz and K. Downes—1236
Contact problems, Theory of hardness and measurements applicable to, Else Holm, Ragnar Holm, and Erle I. Shobert II—319
Convection currents in porous media, H. L. Morrison, F. T. Rogers, Jr., and C. W. Horton—1027
Copper, Grain boundary relaxation and the mechanism of embrittlement of copper by bismuth, T'ing-Sui Kê—1226
Copper, Orientation of single-crystal rods of copper grown from the melt, A. A. Petrauskas and F. Gaudry—1257 (L)
Co-Pt alloys, Ordering reaction in, J. B. Newkirk, A. H. Geisler, and D. L. Martin—816 (L)
Corona onsets, Point-to-plane, William N. English and Leonard B. Loeb—707
Corona, Point-to-plane impulse corona, Donald Baker Moore and William N. English—370
Creep, Bending of beams with, E. P. Popov—251
Creep and damping properties of polystyrene, J. A. Sauer, J. Marin, and C. C. Hsiao—507
Crystal structure factors, Projection of, on the reciprocal lattice, Dan McLachlan, Jr., and C. L. Christ—829
Crystals, zinc single, Internal friction of, Charles A. Wert —29
Cu-Be alloys, Factors affecting the rate of precipitation hardening in, Paul A. Beck—666
Current distributions on some simple antennas, Wayne Webb and Richard C. Raymond—330
Cylinder, prismatic, Torsion of a, with a star-shaped section, H. Ōkubo—1155
Cylinders, coaxial, Electron transit time in space charged limited current between, Paul L. Copeland and Delbert N. Eggenberger—1148
Cylindrical bodies, Distribution of temperature and current in, Carl F. Muckenhoupt—939

Dead time and non-linearity characteristics of the Geiger-counter x-ray spectrometer, Leroy Alexander, Elizabeth Kummer, and Harold P. Klug—735
Demodulation of an F-M carrier and random noise by a limiter and discriminator, Nelson M. Blachman—38
Demodulation of a frequency-modulated carrier and random noise by a discriminator, Nelson M. Blachman—976
Density and packing in an aggregate of mixed spheres, Douglas Rennie Hudson—154
Design of networks for constant time delay, M. H. Hebb, C. W. Horton, and F. B. Jones—616
Determination of the elastic constants of solids by ultrasonic methods, William C. Schneider and Charles J. Burton—48
Determination of preferred orientation in flat transmission samples using a Geiger counter x-ray spectrometer, L. G. Schulz—1033
Determination of relative phases of Fourier coefficients from x-ray diffraction data, Dan McLachlan, Jr.—295 (L); erratum—1011 (L)
Determination of stresses in plastic regions in problems of plane flow, P. S. Symonds—107
Dielectric circular rod, Attenuation in a, Walter M. Elsasser —1193
Dielectric constant and loss of solids and liquids by a cavity perturbation method, Measurement of, George Birnbaum and Jacques Franeau—817 (L)
Dielectric rod, Investigation of, as wave guide, C. H. Chandler—1188
Dielectric surfaces, Microwave antennas and, R. M. Redheffer—397
Differential equations, non-linear, Electro-mechanical device for solving, Carl A. Ludeke—600
Diffraction of an electromagnetic wave through a plane screen, J. W. Miles—760
Dilatometric studies of high polymers. I. Second-order transition temperature. II. Crystallization of aromatic polyesters, Harry J. Kolb and Emmette F. Izard—564, 571
Diodes, High frequency total emission loading in, Nicholas A. Begovich—457
Dipole, Ground plane field of the wide angle conical dipole, P. D. P. Smith—636 (L)
Direct method of determining preferred orientation of a flat reflection sample using a Geiger-counter x-ray spectrometer, L. G. Schulz—1030
Disk-loaded wave guides, E. L. Chu and W. W. Hansen—280
Distribution of temperature and current in cylindrical bodies, Carl F. Muckenhoupt—939
Doppler, Radio Doppler investigation of meteoric heights and velocities, L. A. Manning, O. G. Villard, Jr., and A. M. Peterson—475
Duffing equation, Harmonic and subharmonic response for the, Morris E. Levenson—1045
Dust—an active meteorological factor in the atmosphere of Northern Africa, M. G. El-Fandy—660
Dynamic measurements of polymer physical properties, J. W. Ballou and J. C. Smith—493

Effect of cold work in metals on powder pattern intensities, B. L. Averbach and B. E. Warren—1066
Effect of current magnitude upon the behavior of a superconducting bolometer in its transition region, Nelson Fuson—59
Effect of "multiple grounds" on electron microscope images, W. L. Grube—125 (L)
Effect of surface roughness on eddy current losses at microwave frequencies, Samuel P. Morgan, Jr.—352
Effect of surface roughness on rolling friction, J. J. Bikerman—971
Effect of uplift and denudation on underground temperatures, A. E. Benfield—66
Effective use of collimating apertures in small-angle x-ray diffraction carriers, Orvil E. A. Bolduan and Richard S. Bear—983
Effects of stress and deformation on the Martensite transformation, Andrew W. McReynolds—896
Elastic constants of solids, Determination of, by ultrasonic methods, William C. Schneider and Charles J. Burton—48
Elasticity of zinc crystals, C. A. Wert and E. P. T. Tyndall —587
Elastomers, hevea and gutta, infra-red spectra and structure of, R. A. Saunders and D. C. Smith—953
Electrical contacts, Erosion of, on make, L. H. Germer and F. E. Haworth—1085
Electrically induced fibration of suspensions, W. M. Winslow —1137
Electric-field modulation of ultrasonic signals in liquids, A. W. Nolle—589

Electromagnetic fields, Electron optical mapping of, L. Marton and S. H. Lachenbruch—1171
Electromagnetic wave, Diffraction of, through a plane screen, J. W. Miles—760
Electromagnetic waves, Excitation of, in cylindrical metallic wave guides, A. Colino—576
Electromagnetic waves, Propagation of, in a tube containing a coaxial d. c. discharge, Philip Rosen—868
Electromagnetic waves, Reflection and transmission of, by a spherical shell, Herbert B. Keller and Joseph B. Keller—393
Electromagnetic waves, Scattering cross section of spheres for, L. Brillouin—1110
Electro-mechanical device for solving non-linear differential equations, Carl A. Ludeke—600
Electron beams, tubular, Some properties of, Nelson Wax—242
Electron diffraction studies of thin films, High temperature furnace for, Eileen I. Alessandrini—691
Electron emission and conduction mechanism of oxide-coated cathodes, R. Loosjes and H. J. Vink—884 (L)
Electron-micrographic structure of shadow-cast films and surfaces, Robley C. Williams and Robert C. Backus—98
Electron microscope and diffraction study of metal crystal textures by means of thin sections, R. D. Heidenreich—993
Electron microscope, Illuminating system of, James Hillier and S. G. Ellis—700
Electron microscope images, Effect of "multiple grounds" on, W. L. Grube—125 (L)
Electron microscope images, Phase contrast in, E. G. Ramberg—441
Electron microscope objective, Method of measuring spherical aberration of, Cecil E. Hall—631 (L)
Electron microscope, Technique for the preparation of grease or solid samples dispersed in grease-like media for examination with the, A. Y. Mottlau—1055
Electron microscope technique for the study of polymeric molecules, Wilbur Kaye—1209
Electron microscope, Theoretical resolution limit of the, O. Scherzer—20
Electron microscopy, Improved sectioning technique for, Richard F. Baker and Daniel G. Pease—480 (L)
Electron microscopy, Modification of silica replica technique for study of biological membranes and application of rotary condensation in, F. Heinmets—384
Electron microscopy, Positive-replica technique for, C. M. Schwartz, A. E. Austin, and P. M. Weber—202
Electron microscopy, Spherical particles for, G. David Scott—417 (L)
Electron mirrors, Aberration correction with, E. G. Ramberg—183
Electron optical mapping of electromagnetic fields, L. Marton and S. H. Lachenbruch—1171
Electron optical mapping of fringe fields of ferromagnetic domains, L. Marton, S. H. Lachenbruch, John A. Simpson, and A. VanBronkhorst—1258
Electron temperatures, multiple, Running striations and, N. L. Oleson and C. G. Found—416 (L)
Electron transit time in space charged limited current between coaxial cylinders, Paul L. Copeland and Delbert N. Eggenberger—1148
Electronic radiography and microradiography, Comments on, Herman E. Seemann—231 (L)
e.m.f. method, Study of, C. T. Tai—717
Energy losses of sound waves in metals due to scattering and diffusion, W. P. Mason and H. J. McSkimin, errata—228 (L)
Enumeration of Fourier phase permutations using electronic analog machines, A. D. Booth—388
Equation of state for polystyrene, R. S. Spencer and G. D. Gilmore—502
Erosion of electrical contacts on make, L. H. Germer and F. E. Haworth—1085
Excitation of electromagnetic waves in cylindrical metallic wave guides, A. Colino—576
Experimental investigation of formulas for the prediction of horn radiator patterns, G. A. Woonton, D. R. Hay, and E. L. Vogan—71
Extension of MacFarlane's method of deducing refractive index from radio observations, A. W. Straiton—228 (L)

Factors affecting the rate of precipitation hardening in Cu-Be alloys, Paul A. Beck—666
Ferromagnetic domains, fringe fields of, L. Marton, S. H. Lachenbruch, John A. Simpson, and A. VanBronkhorst—1258 (L)
Fibration of suspensions, Electrically induced, W. M. Winslow—1137
Fields from fluid flow mappers, A. D. Moore—790
Flash radiography applied to ordnance problems, J. C. Clark—363
Flow, Fluid flow patterns, Garrett Birkhoff and Thomas E. Caywood—646
Flow of a perfect fluid between two plates from a circular inlet channel, W. R. Smythe—224 (L)
Flow through a rocket nozzle with and without vibrational equilibrium, S. S. Penner—445
Flow, two-phase, Compressibility effects in, R. F. Tangren, C. H. Dodge, and H. S. Seifert—637
Fluid flow mappers, Fields from, A. D. Moore—790
Fluid flow patterns, Garrett Birkhoff and Thomas E. Caywood—646
Fluid flow problems, compressible, Application of Galerkin's method to, Chi-Teh Wang and R. F. Brodsky—1255
Fluid, perfect, Flow of a, between two plates from a circular inlet channel, W. R. Smythe—224 (L)
F-M carrier, Demodulation of, and random noise by a limiter and discriminator, Nelson M. Blachman—38
F-M receivers, Theoretical signal-to-noise ratios in: a comparison with amplitude modulation, David Middleton—334; errata—724
Formation of recrystallization nuclei, Paul A. Beck—633 (L)
Fourier coefficients, Determination of relative phases of, from x-ray diffraction data, Dan McLachlan, Jr.—295 (L); erratum—1011
Fourier phase permutations, Enumeration of, using electronic analog machines, A. D. Booth—388
Friction, Air, on rapidly moving surfaces—A. R. Kuhlthau—217
Friction coefficient, Incremental—a non-hydrodynamic component of boundary lubrication, J. T. Burwell and C. D. Strang—79
Friction, solid, Magnitude of the mechanical component of, C. D. Strang and C. R. Lewis—1164
Fringe fields of ferromagnetic domains, L. Marton, S. H. Lachenbruch, John A. Simpson, and A. VanBronkhorst—1258
Furnace, High temperature, for electron diffraction studies of thin films, Eileen I. Alessandrini—691

Galerkin's method, Application of, to compressible fluid flow problems, Chi-Teh Wang and R. F. Brodsky—1255
Gas flow, steady, Substitution principle for, R. C. Prim III—448
Gas flows, low density, Torsion balance for measuring forces in, I. Estermann and E. D. Kane—608
Gases, Absorption of microwaves in, George H. Millman and Richard C. Raymond—413 (L)
Geiger-counter spectrometer, Reflection method of determining preferred orientation on, Michael Field and M. Eugene Merchant—741

Geiger-counter x-ray spectrometer, Dead time and non-linearity characteristics of, Leroy Alexander, Elizabeth Kummer, and Harold P. Klug—735
Geiger-counter x-ray spectrometer, Determination of preferred orientation in flat transmission samples using a, L. G. Schulz—1033
Geiger-counter x-ray spectrometer, Direct method of determining preferred orientation of a flat refection sample using a, L. G. Schulz—1030
Generalization of Nyquist's stability criteria, A Vazsonyi—863
—— Comment on, S. J. Mason—867
Geometrical factors affecting x-ray spectrometer maxima, Roy C. Spencer—413 (L)
Glass, Photo-density method of determining the relative penetration of diffused sodium 24 tracer into, James R. Johnson—129; erratum—819 (L)
Glass, Study of the sintering of, G. C. Kuczynski—1160
Glow tube, Stabilization of breakdown voltage and measurement of some critical currents in a, A. B. Pal—451
Gold, Properties of, deposited at liquid air temperature, P. G. Wilkinson and L. S. Birks—1168
Golf balls, Aerodynamics of, John M. Davies—821
Grain boundary model and the mechanism of viscous intercrystalline slip, T'ing-Sui Kê—274
Grain boundary relaxation and the mechanism of embrittlement of copper by bismuth, T'ing-Sui Kê—1226
Grain growth in octachloropropane, W. C. McCrone and P. T. Cheng—230 (L)
—— Paul A. Beck—231 (L)
Grease, Technique for the preparation of grease or solid samples dispersed in grease-like media for examination with the electron microscope, A. Y. Mottlau—1055
Ground plane field of the wide angle conical dipole, P. D. P. Smith—636 (L)
Growth and structure of thin metallic films, Henry Levinstein—306

Hardness, Theory of, and measurements applicable to contact problems, Else Holm, Ragnar Holm, and Erle I. Shobert II—319
Harmonic and subharmonic response for the Duffing equation, Morris E. Levenson—1045
Heat transfer in sweat-cooled porous metals, Sidney Weinbaum and H. L. Wheeler, Jr.—113
Hevea and gutta elastomers, Infra-red spectra and structure of, R. A. Saunders and D. C. Smith—953
High current carbon arc and its mechanism, Wolfgang Finkelnburg—468
High frequency total emission loading in diodes, Nicholas A. Begovich—457
High frequency tubes, On the velocity-dependent characteristics of, Julian K. Knipp—425
High inverse voltage germanium rectifiers, S. Benzer—804
High polymers, Dilatometric studies of. I. Second-order transition temperature. II. Crystallization of aromatic polyesters, Harry J. Kolb and Emmette F. Izard—564, 571
High polymers, Propagation of audiofrequency sound in, R. S. Witte, B. A. Mrowca, and E. Guth—481
High polymers, Propagation of ultrasonic bulk waves in, Donald G. Ivey, B. A. Mrowca, and E. Guth—486
High temperature furnace for electron diffraction studies of thin films, Eileen I. Alessandrini—691
High temperature precision x-ray camera. Some measurements of the thermal coefficients of expansion of beryllium, Paul Gordon—908
Horn radiator patterns, Experimental investigation of formulas for the prediction of, G. A. Woonton, D. R. Hay, and E. L. Vogan—71
Horns, electromagnetic, Measurement of gain of, Allen S. Dunbar and M. Donald Adcock—226 (L)
Illuminating system of the electron microscope, James Hillier and S. G. Ellis—700
Impedance of resonant transmission lines and wave guides, W. W. Harman—1252
Impedance synthesis without use of transformers, R. Bott and R. J. Duffin—816 (L)
Improved sectioning technique for electron microscopy, Richard F. Baker and Daniel G. Pease—480 (L)
Improved spinning top homogeneous spray apparatus, K. R. May—932
Improvement in the shadow-cast replica technique, S. J. Singer and R. F. Petzold—816 (L)
Increase in Q-value and reduction of aging of quartz crystal blanks, A. C. Prichard, M. A. A. Druesne, and D. G. McCaa—1011 (L)
Increasing space charge waves, J. R. Pierce—1060
Incremental friction coefficient—a non-hydrodynamic component of boundary lubrication, J. T. Burwell and C. D. Strang—79
Infinitely long cylindrical antenna, Charles H. Papas—437
Influence of atomic order on the magnetic properties, J. E. Goldman—1131
Influence of magnetic field on recrystallization, R. Smoluchowski and R. W. Turner—745
Infra-red absorption spectra of some polymers at liquid-helium temperatures, Gilbert W. King, R. M. Hainer, and H. O. McMahon—559
Infra-red spectra and structure of hevea and gutta elastomers, R. A. Saunders and D. C. Smith—953
Intercrystalline slip, viscous, Grain boundary model and the mechanism of, T'ing-Sui Kê—274
Internal friction of zinc single crystals, Charles A. Wert—29
Inter-particle interference effects in the small angle x-ray scattering from fine powders, Louis H. Lund and George H. Vineyard—593
Interplanar spacings, Table of, for different target materials for the back reflection region, Suzanne van Dijke Beatty—415 (L)
Interpretation of x-ray patterns of cold-worked metal, B. L. Averbach and B. E. Warren—885 (L)
Investigation of dielectric rod as wave guide, C. H. Chandler—1188
Investigations of a bearing for small angular deflections without any friction and with negligible restoring torque, Helmut Schlitt—297
Ionic substances, Method for studying the forces between metals and, Evelyn C. Marboe and W. A. Weyl—124 (L)
Ionization of paraffin wax by beta-radiation, Andrew Gemant—887
Ionized gas, Measurement of the complex conductivity of an, at microwave frequencies, Fred P. Adler—1115
Ionosphere, Maximum height of reflection of a radio wave in a curved ionosphere layer, John M. Kelso—632 (L)
Ionosphere, Sweep frequency ionosphere equipment, Peter G. Sulzer—187
Ionospheric absorption, R. N. Bracewell and K. Weekes—724 (L)
Ionospheric absorption problem, Note on the, Leslie G. McCracken—229 (L)
Iron compacts, Magnetic properties of, in relation to sintering temperature, Robert Steinitz—712

Lattice constants, Precision determination of, by the powder and rotating crystal methods and applications, M. E. Straumanis—726
Legendre functions, non-integral, Application of, to potential problems, R. N. Hall—925
Lenses, electrostatic, Aberration phenomenon in, Shirley Harrison—412 (L)
Loading in diodes, High frequency total emission, Nicholas A. Begovich—457

Lubricants, extreme-pressure, Thermoelectric experiments with, Robert Schnurmann—376

MacFarlane's method of deducing refractive index from radio observations, Extension of, A. W. Straiton—228 (L)
Machines, Enumeration of Fourier phase permutations using electronic analog machines, A. D. Booth—388
Magnetic amplifiers, Theory of. Barkhausen noise and magnetic amplifiers. I, J. A. Krumhansl and R. T. Beyer—432
——, Barkhausen noise and. II. Analysis of the noise, J. A. Krumhansl and R. T. Beyer—582
Magnetic characteristics of an oriented 50 percent nickel-iron alloy, J. H. Crede and J. P. Martin—966
Magnetic field, Influence of, on recrystallization, R. Smoluchowski and R. W. Turner—745
Magnetic properties of iron compacts in relation to sintering temperature, Robert Steinitz—712
Magnetically controlled wave guide attenuators, Theodore Miller—878
Magnetite concrete for radiation shielding, E. Creutz and K. Downes—1236
Magnitude of the mechanical component of solid friction, C. D. Strang and C. R. Lewis—1164
Mappers, fluid flow, Fields from, A. D. Moore—790
Mapping, Electron optical, of fringe fields of ferromagnetic domains, L. Marton, S. H. Lachenbruch, John A. Simpson, and A. VanBronkhorst—1258
Martensite transformation, Effects of stress and deformation on the, Andrew W. McReynolds—896
Mathematical theory of photo-viscoelasticity, Raymond D. Mindlin—206
Mathematical theory of plasticity, Recent developments in, William Prager—235
Maximum height of reflection of a radio wave in a curved ionosphere layer, John M. Kelso—632 (L)
Measurement of the complex conductivity of an ionized gas at microwave frequencies, Fred P. Adler—1115
Measurement of the dielectric constant and loss of solids and liquids by a cavity perturbation method, George Birnbaum and Jacques Franeau—817 (L)
Measurement of forces resisting armor penetration, A. Victor Masket—132
Measurement of gain of electromagnetic horns, Allen S. Dunbar and M. Donald Adcock—226 (L)
Measurements of the mechanical properties of polymer solutions by electromagnetic transducers, Thor L. Smith, John D. Ferry, and Frederic W. Schremp—144
Metal, cold-worked, Interpretation of x-ray patterns of, B. L. Averbach and B. E. Warren—885 (L)
Metal crystal textures, Electron microscope and diffraction study of, by means of thin sections, R. D. Heidenreich—993
Metal cutting, Analysis of the mechanics of, D. C. Drucker—1013
Metallic films, thin, Growth and structure of, Henry Levinstein—306
Metallic particles, Study of the mechanism of sintering of, J. H. Dedrick and A. Gerds—1042
Metals, Cathodic vacuum etching of, Don M. McCutcheon—414 (L)
Metals, Effect of cold work in, on powder pattern intensities, B. L. Averbach and B. E. Warren—1066
Metals, Energy losses of sound waves in, due to scattering and diffusion, W. P. Mason and H. J. McSkimin, errata—228 (L)
Metals and ionic substances, Method for studying the forces between, Evelyn C. Marboe and W. A. Weyl—124 (L)
Metals, liquid, Subcooling of, D. Turnbull—817 (L)
Metals, sweat-cooled porous, Heat transfer in, Sidney Weinbaum and H. L. Wheeler, Jr.—113
Metal-strip delay structure for microwave lenses, Analysis of, S. B. Cohn—257; addendum—1011
Meteoric heights and velocities, Radio Doppler investigation of, L. A. Manning, O. G. Villard, Jr., and A. M. Peterson—475
Meteorological factor, Dust—an active meteorological factor in the atmosphere of Northern Africa, M. G. El-Fandy—660
Method of equivalent linearization for non-linear oscillatory systems with large non-linearity, Carl A. Ludeke—694
Method for the instantaneous measurement of velocity and temperature in high speed air flow, D. G. Marlow, C. R. Nisewanger, and W. M. Cady—771
Method of measuring dynamic mechanical properties of rubber-like materials, K. W. Hillier, H. Kolsky, and J. P. Lewis—227 (L)
—— A. W. Nolle—227 (L)
Method of measuring spherical aberration of an electron microscope objective, Cecil E. Hall—631 (L)
Method for measuring the total power of small-angle x-ray scattering, B. E. Warren—96
Method for the quantitative evaluation of x-ray patterns from mixed powders adapted to the demands of quantitative analysis, J. C. M. Brentano—1215
Method for studying the distribution and sign of static charges on solid materials, Harry H. Hull—1157
Method for studying the forces between metals and ionic substances, Evelyn C. Marboe and W. A. Weyl—124 (L)
Methyl methacrylate polymers, Transition temperatures of, at ultrasonic frequencies, Thomas F. Protzman—627
Microradiography, Comments on electronic radiography and, Herman E. Seemann—231 (L)
Microwave antennas and dielectric surfaces, R. M. Redheffer—397
Microwave frequencies, Effect of surface roughness on eddy current losses at, Samuel P. Morgan, Jr.—352
Microwave lenses, Analysis of the metal-strip delay structure for, S. B. Cohn—257; addendum—1011
Microwave Q measurements in the presence of series losses, L. Malter and G. R. Brewer—918
Microwaves in gases, Absorption of, George H. Millman and Richard C. Raymond—413 (L)
Millimeter wave region, Transmission properties of materials in, E. Wantuch, J. H. Rohrbaugh, J. P. Cooley, J. H. Greig, and J. Shmoys, erratum—112
Mixing properties of non-linear condensers, Note on, R. V. L. Hartley—819 (L)
Modification of silica replica technique for study of biological membranes and application of rotary condensation in electron microscopy, F. Heinmets—384
Morphology of carbon black particles in shadow-cast specimens, John H. L. Watson—747

n-component systems, Coexistence relations of $n+1$ phases in, Paul M. Pepper—754
Network analysis, electrical, Use of a mechanical harmonic synthesizer in, S. Leroy Brown and Chester M. McKinney—316
Networks for constant time delay, Design of, M. H. Hebb, C. W. Horton, and F. B. Jones—616
Neutrons of various energies, Attenuation of, in water, C. E. Falk and E. Creutz—1183
New interpretation of the n-power law in plastic deformation, Herbert I. Fusfeld—1052
New method of capacity measurement on dry disk rectifiers, K. Lehovec—123 (L)
New solution to the problem of vertical angle-of-arrival of radio waves, E. W. Hamlin, P. A. Seay, and W. E. Gordon—248
Nickel-iron alloy, oriented 50 percent, Magnetic characteristics of, J. H. Crede and J. P. Martin—966

Non-linear condensers, Note on mixing properties of, R. V. L. Hartley—819 (L)
Non-linear oscillatory systems with large non-linearity, Method of equivalent linearization for, Carl A. Ludeke—694
Note on the ionospheric absorption problem, Leslie G. McCracken—229 (L)
Note on "The mixing properties of non-linear condensers," R. V. L. Hartley—819 (L)
Note on "Qualitative experimental verification of the change of burning rate of rocket powders with radiation path length," Henri Muraour—819 (L)
—— S. S. Penner—819 (L)
n-power law, New interpretation of, in plastic deformation, Herbert I. Fusfeld—1052
n-reactance networks, Synthesis of, for desired transient response, Pierre R. Aigrain and Everard M. Williams—597
Nyquist's stability criteria, Generalization of, A. Vazsonyi—863
—— Comment on, S. J. Mason—867

Octachloropropane, Grain growth in, W. C. McCrone and P. T. Cheng—230 (L)
—— Paul A. Beck—231 (L)
Optical equations of three-dimensional photoelasticity, Raymond D. Mindlin and Lawrence E. Goodman—89
Ordering reaction in Co-Pt alloys, J. B. Newkirk, A. H. Geisler, and D. L. Martin—816 (L)
Ordnance problems, Flash radiography applied to, J. C. Clark—363
Orientation of single-crystal rods of copper grown from the melt, A. A. Petrauskas and F. Gaudry—1257
Oxide cathode, Application of thermodynaamics to chemical problems involving the, Addison H. White—856
Oxide cathode coatings, Resistance of, for high values of pulsed emission, W. E. Danforth and D. L. Goldwater—163
Oxide cathode, Some properties of the Ba_2SiO_4 oxide cathode interface, A. Eisenstein—776
Oxide cathodes, Semiconducting properties in, N. B. Hannay, D. MacNair, and Addison H. White—669
Oxide-coated cathodes, Electron emission and conduction mechanism of, R. Loosjes and H. J. Vink—884 (L)
Oxide-coated cathodes, Work functions and conductivity of, G. W. Mahlman—197

Papers by Hadrian Stahl, G. H. Metson—1130 (L)
Paraffin wax, Ionization of, by beta-radiation, Andrew Gemant—887
Particle size determination by soft x-ray scattering, K. L. Yudowitch—174
Particles, spherical, Small, of exceptionally uniform size, Robert C. Backus and Robley C. Williams—224 (L)
Phase contrast in electron microscope images, E. G. Ramberg—441
Phase distribution in two-phase solids, L. D. Jaffe—1206
Phase lead for a.c. servo mechanisms, Arthur H. Benner—268
Phosphors, Response of certain inorganic phosphors to far ultraviolet radiation, D. H. Tomboulian and E. M. Pell—263
Photo-density method of determining the relative penetration of diffused sodium 24 tracer into glass, James R. Johnson—129; erratum—819 (L)
Photoelasticity, three-dimensional, Optical equations of, Raymond D. Mindlin and Lawrence E. Goodman—89
Photo-viscoelasticity, Mathematical theory of, Raymond D. Mindlin—206
Physical properties of titanium. I—Emissivity and resistivity of the commercial metal, Walter C. Michels and Sally Wilford—1223
Plane flow, problems of, Determination of stresses in plastic regions in, P. S. Symonds—107
Plastic deformation, New interpretation of the *n*-power law in, Herbert I. Fusfeld—1052
Plastic deformation, Role of rifting in cold-work and a possible measure of, Donald P. Smith—1186
Plastic flow, anisotropic, Stress-strain rate relations for, John E. Dorn—15
Plastic flow effects in steel, Orrin H. Clark and Ernest M. Lyman—884 (L)
Plastic regions in problems of plane flow, Determination of stresses in, P. S. Symonds—107
Plasticity, mathematical theory of, Recent developments in, William Prager—235
Plasticizers, Compatibility, efficiency and permanence of, Raymond F. Boyer—540
Plate, Bending of a thin circular plate of an aeolotropic material under uniform lateral load (supported edge), H. Ōkubo—1151
Point-to-plane corona onsets, William N. English and Leonard B. Loeb—707
Point-to-plane impulse corona, Donald Baker Moore and William N. English—370
Polyesters, aromatic, Crystallization of, Harry J. Kolb and Emmette F. Izard—571
Polyethylene, X-ray diffraction studies of the stretching and relaxing of, Alexander Brown—552
Polymer physical properties, Dynamic measurements of, J. W. Ballou and J. C. Smith—493
Polymer solutions, mechanical properties of, Measurements of, by electromagnetic transducers, Thor L. Smith, John D. Ferry, and Frederic W. Schremp—144
Polymeric molecules, Electron microscope technique for the study of, Wilbur Kaye—1209
Polymerization in the solid state, E. Miller, I. Fankuchen, and H. Mark—531
Polymers, Infra-red absorption spectra of some polymers at liquid-helium temperatures, Gilbert W. King, R. M. Heiner, and H. O. McMahon—559
Polymers, methyl methacrylate, Transition temperatures of, at ultrasonic frequencies, Thomas F. Protzman—627
Polystyrene, Creep and damping properties of, J. A. Sauer, J. Marin, and C. C. Hsiao—507
Polystyrene, Equation of state for, R. S. Spencer and G. D. Gilmore—502
Porous materials, Structure of, from gas penetration rates, F. A. Schwertz—1070
Positive-replica technique for electron microscopy, C. M. Schwartz, A. E. Austin, and P. M. Weber—202
Potential functions for a thermionic vacuum tube, E. C. Okress—850
Precipitation hardening in Cu-Be alloys, Factors affecting the rate of, Paul A. Beck—666
Precipitation from solid solutions of C and N in α-iron, Charles A. Wert—943
Precision determination of lattice constants by the powder and rotating crystal methods and applications, M. E. Straumanis—726
Preliminary study of a physical basis of bird navigation, William C. Schumacher—123 (L)
Probability criterion for the design of servo mechanisms, John R. Ragazzini and Lotfi A. Zadeh—141
Projection of crystal structure factors on the reciprocal lattice, Dan McLachlan, Jr. and C. L. Christ—829
Propagation of audiofrequency sound in high polymers, R. S. Witte, B. A. Mrowca, and E. Guth—481
Propagation of electromagnetic waves in a tube containing a coaxial d. c. discharge, Philip Rosen—868
Propagation of transverse waves in viscoelastic media, F. T. Adler, W. M. Sawyer, and John D. Ferry—1036

Propagation of ultrasonic bulk waves in high polymers, Donald G. Ivey, B. A. Mrowca, and E. Guth—486
Properties of gold deposited at liquid air temperature, P. G. Wilkinson and L. S. Birks—1168
Pulse emission decay phenomenon in oxide-coated cathodes, G. R. Feaster—415 (L)

Quartz crystal blanks, Increase in Q-value and reduction of aging of, A. C. Prichard, M. A. A. Druesne, and D. G. McCaa—1011 (L)

Radiation resistances of loaded antennas, Richard C. Raymond and Wayne Webb—328
Radiation shielding, Magnetite concrete for, E. Creutz and K. Downes—1236
Radio Doppler investigation of meteoric heights and velocities, L. A. Manning, O. G. Villard, Jr., and A. M. Peterson—475
Radio wave, Maximum height of reflection of, in a curved ionosphere layer, John M. Kelso—632 (L)
Radio waves, New solution to the problem of vertical angle-of-arrival of, E. W. Hamlin, P. A. Seay, and W. E. Gordon—248
Radiography, Flash, applied to ordnance problems, J. C. Clark—363
Recent developments in the mathematical theory of plasticity, William Prager—235
Recrystallization, Influence of magnetic field on, R. Smoluchowski and R. W. Turner—745
Recrystallization nuclei, Formation of, Paul A. Beck—633 (L)
Rectifiers, dry disk, New method of capacity measurement on, K. Lehovec—123 (L)
Rectifiers, High inverse voltage germanium rectifiers, S. Benzer—804
Reflection method of determining preferred orientation on the Geiger-counter spectrometer, Michael Field and M. Eugene Merchant—741
Reflection and transmission of electromagnetic waves by a spherical shell, Herbert B. Keller and Joseph B. Keller—393
Refractive index, Extension of MacFarlane's method of deducing refractive index from radio observations, A. W. Straiton—228 (L)
Refractories, two, Thermionic emitting properties of, R. E. Haddad, D. L. Goldwater, and F. H. Morgan—1130 (L)
Relationship between Gough-Joule coefficients and moduli of vulcanized rubbers, F. S. Conant, G. L. Hall, and G. R. Thurman—526
Resistance of oxide cathode coatings for high values of pulsed emission, W. E. Danforth and D. L. Goldwater—163
Resolution limit, Theoretical, of the electron microscope, O. Scherzer—20
Resonance effect in the synchrotron, E. D. Courant—611
Response of certain inorganic phosphors to far ultraviolet radiation, D. H. Tomboulian and E. M. Pell—263
Rifting, Role of, in cold-work and a possible measure of plastic deformation, Donald P. Smith—1186
Rocket nozzle, Flow through a, with and without vibrational equilibrium, S. S. Penner—445
Rocket powders, Note on "Qualitative experimental verification of the change of burning rate of rocket powders with radiation path length," Henri Muraour—819 (L)
—— S. S. Penner—819 (L)
Role of rifting in cold-work and a possible measure of plastic deformation, Donald P. Smith—1186
Rolling friction, Effect of surface roughness on, J. J. Bikerman—971
Rubber, Time and stress effects in the behavior of rubber at low temperature, J. R. Beatty and J. M. Davies—533
Rubber-like materials, Method of measuring dynamic mechanical properties of, K. W. Hillier, H. Kolsky, and J. P. Lewis—227 (L)
—— A. W. Nolle—227 (L)
Rubbers, vulcanized, Relationship between Gough-Joule coefficients and moduli of, F. S. Conant, G. L. Hall, and G. R. Thurman—526
Running striations and multiple electron temperatures, N. L. Oleson and C. G. Found—416 (L)

Scattering cross section of spheres for electromagnetic waves, L. Brillouin—1110
Scattering by an inhomogeneous solid, P. Debye and A. M. Bueche—518
Second-order partial differential equations, Triangulation of a two-dimensional continuum for the purpose of the approximate solution of, L. Tasny-Tschiassny—419
Sectioning technique, Improved, for electron microscopy, Richard F. Baker and Daniel G. Pease—480 (L)
Semiconducting properties in oxide cathodes, N. B. Hannay, D. MacNair, and Addison H. White—669
Servo mechanisms, a.c., Phase lead for, Arthur H. Benner—268
Servo mechanisms, design of, Probability criterion for, John R. Ragazzini and Lotfi A. Zadeh—141
Shadow-cast films and surfaces, Electron-micrographic structure of, Robley C. Williams and Robert C. Backus—98
Shadow-cast replica technique, Improvement in, S. J. Singer and R. F. Petzold—816 (L)
Shadow-cast specimens, Morphology of carbon black particles in, John H. L. Watson—747
Shell, spherical, Reflection and transmission of electromagnetic waves by a, Herbert B. Keller and Joseph B. Keller—393
Shock tube, Transonic flow in a, D. K. Weimer, C. H. Fletcher, and W. Bleakney—418 (L)
Silica replica technique, Modification of, for study of biological membranes and application of rotary condensation in electron microscopy, F. Heinmets—384
Sintering of glass, Study of, G. C. Kuczynski—1160
Sintering of metallic particles, Study of the mechanism of, J. H. Dedrick and A. Gerds—1042
Sixth Annual Pittsburgh Conference on x-ray and electron diffraction—725
Small spherical particles of exceptionally uniform size, Robert C. Backus and Robley C. Williams—224 (L)
Sodium 24 tracer, Photo-density method of determining the relative penetration of diffused sodium 24 tracer into glass, James R. Johnson—129; erratum—819 (L)
Solid state, Polymerization in the, E. Miller, I. Fankuchen, and H. Mark—531
Some properties of the Ba_2SiO_4 oxide cathode interface, A. Eisenstein—776
Some properties of tubular electron beams, Nelson Wax—242 (L)
Sound waves, Energy losses of, in metals due to scattering and diffusion, W. P. Mason and H. J. McSkimin, errata—228
Spheres, mixed, Density and packing in an aggregate of, Douglas Rennie Hudson—154
Spherical particles for electron microscopy, G. David Scott—417 (L)
Spherical precipitates, Theory of growth of, from solid solution, Clarence Zener—950
Spray apparatus, Improved spinning top homogeneous spray apparatus, K. R. May—932
Stabilization of breakdown voltage and measurement of some critical currents in a glow tube, A. B. Pal—451
Stahl, Papers by Hadrian Stahl, G. H. Metson—1130 (L)
Static charges on solid materials, Method for studying the distribution and sign of, Harry H. Hull—1157

Steel, Note on some plastic flow effects in, Orrin H. Clark and Ernest M. Lyman—884 (L)
Stresses in plastic regions in problems of plane flow, Determination of, P. S. Symonds—107
Stress-strain rate relations for anisotropic plastic flow, John E. Dorn—15
Structure of extremely thin layers evaporated in kinetic vacuum systems, H. A. Stahl—1
Structure of porous materials from gas penetration rates, F. A. Schwertz—1070
Study of the e.m.f. method, C. T. Tai—717
Study of the mechanism of sintering of metallic particles, J. H. Dedrick and A. Gerds—1042
Study of the sintering of glass, G. C. Kuczynski—1160
Subcooling of liquid metals, D. Turnbull—817 (L)
Substitution principle for steady gas flow, R. C. Prim III—448
Supersonic flow patterns, M. M. Munk—302
Surface polarization and wettability of inorganic substances by water, D. P. Enright, L. R. Sonders, and W. A. Weyl—1011 (L)
Surface roughness, Effect of, on eddy current losses at microwave frequencies, Samuel P. Morgan, Jr.—352
Surface-fitting in three variables, Morris Morduchow—390
Surfaces, rapidly moving, Air friction on, A. R. Kulthau—217
Sweep frequency ionosphere equipment, Peter G. Sulzer—187
Synchrotron, Resonance effect in the, E. D. Courant—611
Synthesis of *n*-reactance networks for desired transient response, Pierre R. Aigrain and Everard M. Williams—597
Synthesizer, mechanical harmonic, Use of, in electric wave filter analysis, S. Leroy Brown and James M. Sharp—578
Synthesizer, mechanical harmonic, Use of, in electrical network analysis, S. Leroy Brown and Chester M. McKinney—316

Table of interplanar spacings for different target materials for the back reflection region, Suzanne van Dijke Beatty—415 (L)
Technique for the preparation of grease or solid samples dispersed in grease-like media for examination with the electron microscope, A. Y. Mottlau—1055
Temperatures, underground, Effect of uplift and denudation on, A. E. Benfield—66
Tensor field equations in a region of variable refractive index, P. D. P. Smith—633 (L)
Theoretical resolution limit of the electron microscope, O. Scherzer—20
Theoretical signal-to-noise ratios in f-m receivers: a comparison with amplitude modulation, David Middleton—334; errata—724 (L)
Theory of growth of spherical precipitates from solid solution, Clarence Zener—950
Theory of hardness and measurements applicable to contact problems, Else Holm, Ragnar Holm, and Erle I. Shobert II—319
Thermal behavior of evaporated layer vacuum devices, H. A. Stahl—8; erratum—724 (L)
Thermionic emission from sintered cathode of thoria and tungsten mixture, H. Y. Fan—682
Thermionic emitter, Zirconium carbide as a, R. E. Haddad, D. L. Goldwater, and F. H. Morgan—886 (L)
Thermionic emitting properties of two refractories, R. E. Haddad, D. L. Goldwater, and F. H. Morgan—1130 (L)
Thermodynamics, Application of, to chemical problems involving the oxide cathode, Addison H. White—856
Thermoelectric experiments with extreme-pressure lubricants, Robert Schnurmann—376
Thin films peeled from Teflon, C. K. Jones—1257 (L)
Thoria cathodes, Activation phenomena with, O. A. Weinreich—1256 (L)
Time constants for vacuum gauge systems, S. A. Schaaf and R. R. Cyr—860
Time and stress effects in the behavior of rubber at low temperature, J. R. Beatty and J. M. Davies—533
Titanium, Physical properties of. I—Emissivity and resistivity of the commercial metal, Walter C. Michels and Sally Wilford—1223
Titanium, Use of titanium and zirconium nitrides as a conducting element in thoria cathodes, O. B. Bush, R. B. Vandegrift, and T. E. Hanley—295 (L)
Torsion balance for measuring forces in low density gas flows, I. Estermann and E. D. Kane—608
Torsion of a prismatic cylinder with a star-shaped section, H. Ōkubo—1155
Transducers, electromagnetic, Measurements of the mechanical properties of polymer solutions by, Thor L. Smith, John D. Ferry, and Frederic W. Schremp—144
Transition temperatures of methyl methacrylate polymers at ultrasonic frequencies, Thomas F. Protzman—627
Transmission properties of materials in the millimeter wave region, E. Wantuch, J. H. Rohrbaugh, J. P. Cooley, J. H. Greig, and J. Shmoys, erratum—112
Transonic flow in a shock tube, D. K. Weimer, C. H. Fletcher, and W. Bleakney—418 (L)
Traveling-wave tube (Discussion of waves for large amplitudes), L. Brillouin—1110
Triangulation of a two-dimensional continuum for the purpose of the approximate solution of second-order partial differential equations, L. Tasny-Tschiassny—419

Ultrasonic bulk waves in high polymers, Propagation of, Donald G. Ivey, B. A. Mrowca, and E. Guth—486
Ultrasonic methods, Determination of the elastic constants of solids by, William C. Schneider and Charles J. Burton—48
Ultrasonic phenomena, Visual methods for studying, R. Bowling Barnes and Charles J. Burton—286
Ultrasonic signals in liquids, Electric-field modulation of, A. W. Nolle—589
Ultrasonic waves through thin plates of material, Visual method for demonstrating the path of, Charles J. Burton and R. Bowling Barnes—462
Ultraviolet radiation, far, Response of certain inorganic phosphors to, D. H. Tomboulian and E. M. Pell—263
Uplift and denudation, Effect of, on underground temperatures, A. E. Benfield—66
Use of a mechanical harmonic synthesizer in electric wave filter analysis, S. Leroy Brown and James M. Sharp—578
Use of a mechanical harmonic synthesizer in electrical network analysis, S. Leroy Brown and Chester M. McKinney—316
Use of titanium and zirconium nitrides as a conducting element in thoria cathodes, O. B. Bush, R. B. Vandegrift, and T. E. Hanley—295 (L)

Vacuum devices, evaporated layer, Thermal behavior of, H. A. Stahl—8; erratum—724 (L)
Vacuum gage systems, Time constants for, S. A. Schaaf and R. R. Cyr—860
Vacuum systems, kinetic, Structure of extremely thin layers evaporated in, H. A. Stahl—1
Vacuum tube, thermionic, Potential functions for a, E. C. Okress—850
Vaporization of the cathode in the electric arc, Ragnar Holm—715
Velocity-dependent characteristics of high frequency tubes, Julian K. Knipp—425
Vibrational equilibrium, Flow through a rocket nozzle with and without, S. S. Penner—445
Viscoelastic media, Propagation of transverse waves in, F. T. Adler, W. M. Sawyer, and John D. Ferry—1036

Viscosity, anomalous, Coefficient of, Charles Mack—225 (L)
Visual method for demonstrating the path of ultrasonic waves through thin plates of material, Charles J. Burton and R. Bowling Barnes—462
Visual methods for studying ultrasonic phenomena, R. Bowling Barnes and Charles J. Burton—286
Volume changes in the plastic stages of simple compression, P. W. Bridgman—1241

Water, Attenuation of neutrons of various energies in, C. E. Falk and E. Creutz—1183
Water, Surface polarization and wettability of inorganic substances by, D. P. Enright, L. R. Sonders, and W. A. Weyl—1011 (L)
Wave filter analysis, electric, Use of a mechanical harmonic synthesizer in, S. Leroy Brown and James M. Sharp—578
Wave guide attenuators, Magnetically controlled, Theodore Miller—878
Wave guide, Investigation of dielectric rod as wave guide, C. H. Chandler—1188
Wave guides, cylindrical metallic, Excitation of electromagnetic waves in, A. Colino—576
Wave guides, Disk-loaded, E. L. Chu and W. W. Hansen—280
Wave guides, Impedance of resonant transmission lines and, W. W. Harman—1252
Wave guides for slow waves, W. Walkinshaw—634 (L)
Waves, Increasing space-charge waves, J. R. Pierce—1060
Waves, Traveling-wave tube (Discussion of waves for large amplitudes), L. Brillouin—1196
Wettability of inorganic substances by water, Surface polarization and, D. P. Enright, L. R. Sonders, and W. A. Weyl—1011 (L)
Work functions and conductivity of oxide-coated cathodes, G. W. Mahlman—197

X-ray camera, High temperature precision. Some measurements of the thermal coefficients of expansion of beryllium, Paul Gordon—908
X-ray diffraction carriers, small-angle, Effective use of collimating apertures in, Orvil E. A. Bolduan and Richard S. Bear—983
X-ray diffraction data, Determination of relative phases of Fourier coefficients from, Dan McLachlan, Jr.—295 (L); erratum—1011 (L)
X-ray diffraction line broadening and strain hardening, D. Rosenthal—1257 (L)
X-ray diffraction studies on the stretching and relaxing of polyethylene, Alexander Brown—552
X-ray and electron diffraction, Sixth Annual Pittsburgh Conference on—725
X-ray, Geometrical factors affecting x-ray spectrometer maxima, Roy C. Spencer—413 (L)
X-ray mass absorption coefficients, Calculation of, John A. Victoreen—1141
X-ray patterns of cold-worked metal, Interpretation of, B. L. Averbach and B. E. Warren—885 (L)
X-ray patterns, Method for the quantitative evaluation of, from mixed powders adapted to the demands of quantitative analysis, J. C. M. Brentano—1215
X-ray scattering, small angle, Collimation error in, K. L. Yudowitch—1232
X-ray scattering, small angle, from fine powders, Interparticle interference effects in, Louis H. Lund and George H. Vineyard—593
X-ray scattering, small-angle, Method for measuring the total power of, B. E. Warren—96
X-ray scattering, soft, Particle size determination by, K. L. Yudowitch—174
X-ray spectrometer, Determination of preferred orientation in flat transmission samples using a Geiger-counter x-ray spectrometer, L. G. Schulz—1033
X-ray spectrometer, Direct method of determining preferred orientation of a flat reflection sample using a Geiger-counter x-ray spectrometer, L. G. Schulz—1030

Yarn, Apparatus to depict the load-elongation diagram of yarn at five cycles per second, Francis Breazeale and John Whisnant—621

Zinc crystals, Elasticity of, C. A. Wirt and E. P. T. Tyndall—587
Zinc single crystals, Internal friction of, Charles A. Wert—29
Zirconium carbide as a thermionic emitter, R. E. Haddad, D. L. Goldwater, and F. H. Morgan—886 (L)
Zirconium, Use of titanium and zirconium nitrides as a conducting element in thoria cathodes, O. B. Bush, R. B. Vandegrift, and T. E. Hanley—295 (L)